

REMARKS/ARGUMENTS

Applicant would like to thank the Examiner for the careful consideration given the present application. The application has been carefully reviewed in light of the Office Action, and amended as believed to be appropriate to place the application into condition for allowance.

Specifically, by this amendment, claim 1 has been amended. No claims have been canceled and no new claims have been added to the application. Claim 1 has been amended to incorporate the teachings set forth on page 18, lines 12-13, of the specification. Accordingly, claims 1-8 remain pending in the application. No new matter has been added.

In the prior Office Action, the Examiner rejected claims 1-8 under 35 U.S.C. §103(a) as being unpatentable over an English machine translation of Sumiya et al. (JP 2003-229141) further in view of Hatoh et al. (US 2003/0143454), Soczka-Guth et al. (US 6,632,847) and Seki et al. (JP 408148152). For the reasons set forth below, and in view of the amendments made to claim 1 herein, applicant respectfully submits that the claim rejections are improper and should be withdrawn.

Sumiya et al., discloses a method of making an electrode-membrane assembly for a fuel cell. In accordance with the teachings of Sumiya et al., a binder layer 15a is applied to carbon paper 13a (see Fig. 3a and paragraph [0033]). Next, a negative electrode layer 17 is applied to the undried binder layer 15a, and then an ion-exchange membrane 19 is applied on the undried electrode layer 17 (see Figs. 3a and 3b and paragraph [0034]). Next, a positive electrode layer 18 is applied to the undried ion-exchange membrane 19 (see Figs. 4a and paragraph [0035]). Next, a binder layer 16a is applied to the undried positive electrode layer 18, and a carbon paper 14a is applied over the undried binder layer 16a (see Figs. 4b and 5a and paragraph [0036]). Finally, the binder layer 15a, negative electrode layer 17, ion-exchange membrane 19, positive electrode layer 18 and binder layer 16 are dried together (see Fig. 5b and paragraph [0037]).

Hatoh et al. also discloses a method of making an electrode-membrane assembly for a fuel cell. In accordance with the teachings of Hatoh et al., however, an electrolyte membrane 1 having catalyst (electrode) layers 2 formed on each of the front and rear surfaces thereof is bonded, using a hot press, with a pair of gas

diffusion layers 4 each having a water repellent layer 3 formed thereon such that the water repellent layer contacts the catalyst layers 2 (see Fig. 1 and col. 12, line 46-53). Hatoh et al. teaches that the catalyst (electrode) layers 2 are preferably applied to the electrolyte membrane 1 in a dry state by an electrostatic coating process (see col. 10, lines 27-39). The same completely dry process is also preferred for the formation of the gas diffusion layers. Hatoh et al. teaches that the electrostatic process is superior to a spray printing process (see col. 10, lines 56-64), which requires the removal of solvents.

Soczka-Guth et al. discloses a polymer composition suitable for producing an ion-exchange membrane for electrode-membrane assemblies for fuel cells and various solvents therefore. And Seki (English language translation) discloses that a solvent can be removed from an electrode of a fuel cell by heating the electrode in water vapor at a temperature above the boiling point of the solvent.

In the prior Office Action, the Examiner acknowledges that Sumiya et al. does not teach at least the following limitations of claim 1:

superposing on the other electrode layer before the drying of the other electrode layer a two-layer body formed by coating the other of the positive and negative electrode diffusion layers with a substrate layer to produce an electrode-membrane assembly

The Examiner reasons that these limitations would have been obvious to one having ordinary skill in the art in view of the teachings of Hatoh et al. because "Hatoh et al. teaches it is a suitable method of making fuel cells." Applicant respectfully disagrees. Hatoh et al. must be read in its entirety and applied for what it fairly teaches. What Hatoh et al. fairly teaches is that the catalyst (electrode) layers should be applied to the membrane by a dry electrostatic process, which Hatoh et al. unequivocally states is superior to a solvent process. Thus, one having ordinary skill in the art would not find it obvious to superpose on the other electrode layer before the drying of the other electrode layer a two-layer body formed by coating the other of the positive and negative electrode diffusion layers with a substrate layer to produce an electrode-membrane assembly in view of the teachings of Hatoh et al. because the teachings of Hatoh et al. would lead one having ordinary skill in the art to utilize a completely dry process that included no solvents to be dried.

The Examiner further contends that Seki teaches the removal of a solvent from an electrode membrane of a fuel cell by heating the electrode in water vapor at a temperature above the boiling point of the solvent. This is true. But claim 1 includes a preliminary drying step, which is not disclosed in Seki or in any other prior art reference of record. Furthermore, claim 1 has been amended to clarify that final drying is accomplished by heating at a temperature not exceeding the decomposition temperature of the hydrocarbon solid polymer and lower than the boiling point of the solvent. This is contrary to Seki, which teaches that the temperature should be maintained "at a level above the boiling point of the solvent." Accordingly, a *prima facie* case of obviousness is simply cannot be made out via the combination of Sumiya et al., Hatoh et al., Soczka-Guth et al. and Seki. Reconsideration is thus respectfully requested.

In light of the foregoing, it is respectfully submitted that the present application is in a condition for allowance and notice to that effect is hereby requested. If it is determined that the application is not in a condition for allowance, the Examiner is invited to initiate a telephone interview with the undersigned attorney to expedite prosecution of the present application.

If there are any additional fees resulting from this communication, please charge same to our Deposit Account No. 18-0160, our Order No. SHM-16622.

Respectfully submitted,

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